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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/705,661

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Kazuto Okazaki

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7590

07/10/2006

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EXAMINER

NECKEL, ALEXA DOROSHENK

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/705,661

Applicant(s)

OKAZAKI ET AL.

Examiner

Alexa D. Neckel

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 8-9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (as shown in Fig. 1 of instant specification and as described on P1/L15-P5/L29) in view of Lutz et al. (USP 4,586,344) and Oswalt et al. (USP 4,769,998).

Regarding claims 8-9, Admitted Prior Art discloses similar apparatus for production of acrylic acid or acrolein comprising:

- a catalytic gas phase oxidation reactor (4);
- an evaporator (3) for gasifying liquefied propylene and/or propane (14);
- means (24) for supplying a coolant (17) to said evaporator (3);
- means (3) for chilling the coolant (17) in the evaporator (3) by recovering latent heat of the liquefied propylene and/or propane (14) (P3/L19-25);
- means for subjecting resultant gasified propylene and/or propane to said catalytic gas phase oxidation reactor (4) thereby preparing a gas containing acrylic acid or acrolein (Fig. 1);
- wherein said means (3) chilling the coolant (17) includes means (24) for adjusting the temperature of said coolant (17) or means for adjusting a flow amount thereof (Fig. 1); and
- means for adjusting pressure of the evaporator (24).

Regarding limitations recited in claim 8 which are directed to a manner of operating disclosed apparatus (such as recited specific pressure range), neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP 2114 and 2115. Further, process limitations (such as recited specific pressure range), do not have patentable weight in an apparatus claim. See *Ex Parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

The Admitted Prior Art only discloses wherein the source of coolant for the evaporator is steam, not a liquid in the range of 0 to 50°C.

Lutz et al. teaches an evaporator (5) for liquid propane (12) with a source of liquid coolant (14) at about 50°C (C4/L26-30) along with a means to adjust the pressure of the evaporator from about 0.1 to 0.7 MPa (1 to 7 bar) (C4/L21-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a coolant liquid as taught by Lutz et al. in the evaporator of the Admitted Prior Art as it is merely the selection of coolant known to be effective in an evaporator and one would have a reasonable expectation of success in selecting such a known coolant.

Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24- P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler

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(9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). The reference does not explicitly disclose that said chilled coolant can be used in said heat exchangers in the apparatus and later re- circulated back to the evaporator.

Oswalt et al. teaches that it is known to prepare a process coolant, which can be used as a coolant in heat exchangers in various processes (C1/L9-19), by passing a liquid coolant through an evaporator (6). Chilled coolant from said evaporator (6) is used in various processes and spent process coolant is being re-circulated back to the evaporator (6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a liquid coolant in the evaporator of Admitted Prior Art to prepare a chilled coolant and to use said chilled coolant in the heat exchangers in the apparatus for production of acrylic acid or acrolein, as taught by Oswalt et al., for the purpose improving operation efficiency. Said modification would merely amount to using an available coolant rather than a coolant which has to be prepared in auxiliary process, therefore saving an operation cost of said auxiliary process.

While the references disclose that said coolant can be used to control temperature of various processes, including chemical reactions (Oswalt et al. C1/L9-19 and C6/L63-32), the references do not explicitly disclose any specific temperatures for liquid coolant before or after said coolant is passed through the evaporator. As the temperature at which chemical reactions are being conducted is a variable that can be

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modified, among others, by adjusting the temperature of coolant used to remove heat from said chemical reactions, with said reactions temperature decreasing as the temperature of the coolant is decreased, the precise temperature of the coolant (at any point of the process) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed coolant temperatures cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the coolant temperatures at various process stages in the apparatus of Admitted Prior Art in view of Oswalt et al. to maintain the desired temperature of chemical reaction conducted in said apparatus (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claim 14, Admitted Prior Art discloses similar apparatus for production of acrylic acid or acrolein comprising:

- a catalytic gas phase oxidation reactor (4);
- an evaporator (3) for gasifying liquefied propylene and/or propane (14);
- means (24) for supplying a coolant (17) to said evaporator (3);
- means (3) for chilling the coolant (17) in the evaporator (3) by recovering latent heat of the liquefied propylene and/or propane (14) (P3/L19-25);

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wherein said means (3) chilling the coolant (17) includes means (24) for adjusting the temperature of said coolant (17) or means for adjusting a flow amount thereof (Fig. 1); and

means (4) for subjecting resultant gasified propylene and/or propane to a catalytic gas phase oxidation reaction thereby preparing a gas containing acrylic acid or acrolein (Fig. 1).

The Admitted Prior Art only discloses wherein the source of coolant for the evaporator is steam, not a liquid in the range of 0 to 50°C.

Lutz et al. teaches an evaporator (5) for liquid propane (12) with a source of liquid coolant (14) at about 50°C (C4/L26-30) along with a means to adjust the pressure of the evaporator from about 0.1 to 0.7 MPa (1 to 7 bar) (C4/L21-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a coolant liquid as taught by Lutz et al. in the evaporator of the Admitted Prior Art as it is merely the selection of coolant known to be effective in an evaporator and one would have a reasonable expectation of success in selecting such a known coolant.

Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24- P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). The reference does not explicitly disclose that said chilled coolant can be

used in said heat exchangers in the apparatus and later re-circulated back to the evaporator.

With respect to Oswald et al., the same comments apply as set forth above.

Response to Arguments

3. Applicant's arguments with respect to claims 8 and 14 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa D. Neckel whose telephone number is 571-272-

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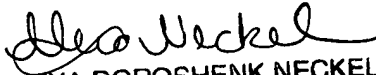
1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alexa D. Neckel
Primary Examiner
Art Unit 1764

July 5, 2006


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER